REMARKS

Claims 1-4, 6-9, 11-13 and 15-35 were pending for the second Office Action dated January 17, 2001. Claims 1, 2, 4, 6-9, 11-13, 15-19 and 28-32 have been indicated as allowable. Claims 3, 20-27 and 33-35 were objected to because of various informalities, but were indicated as allowable if rewritten to rectify the cited informalities. In light of the following amendments and remarks, reconsideration and allowance of the subject application are hereby requested.

In paragraph 2 of the Office Action, various drawing figures were objected to as failing to comply with 37 CFR 1.84(p)(4). Pursuant to 37 CFR 1.121(a)(3)(ii), the Applicant has provided proposed drawing changes on a separate paper in accordance with 37 C. F. R. §1.121(a)(3)(ii), including proposed changes that address the discrepancies mentioned in the prior Office Action dated August 21, 2000. Approval of the proposed drawing changes is respectfully requested. The Applicant will submit formal drawings that incorporate the proposed changes upon allowance of the subject application.

In paragraph 5 of the Office Action, the Abstract was objected to under 37 CFR 1.72 for exceeding 150 words. The Applicant has amended the Abstract to address this objection. Withdrawal of the objection to the Abstract is respectfully requested.

In paragraph 6 of the Office Action, the Specification was objected to because of terms that were considered not clear or exact. The Applicant has amended the Specification to address each of the cited objections. The Applicant has also examined the Specification for additional informalities and has amended the Specification to address numerous typographical, grammatical and spelling errors.

Due to the large number of amendments made to the Specification, pursuant to 37 CFR § 1.125(b)(2), the Applicant is filing herewith a marked-up copy of the first marked-up substitute specification filed on October 5, 2000. A second substitute specification is also being filed herewith in clean form pursuant to 37 CFR § 1.125(c). The second substitute specification includes no new matter in accordance with 37 CFR § 1.125(b)(1).

In paragraph 7 of the Office Action, claims 3, 20, 25, 33, 35 and the claims depending therefrom were objected to because of various informalities. With regard to the objection to claim 3, the Applicant respectfully submits that this claim is in proper form. Although claims 1-3 read on the embodiment of the invention illustrated in FIGS. 1A-1C, these claims also read on other embodiments of the invention, such as, for example, the embodiment illustrated in FIGS. 11A-11C. It is submitted that currently pending dependent claim 3 at least reads on the embodiment of the invention illustrated in FIGS. 11A-11C, and is therefore considered to be in proper form for allowance. The Applicant has addressed the remainder of the objections cited in paragraph 7 of the Office Action and respectfully requests withdrawal of the objection to claims 3, 20-27 and 33-35.

The Applicant has also amended several of the claims to improve their form. In claims 1, 6 and 11, the phrase "over the definable range of rotation" has been removed as it appears to be superfluous. Additionally, in claims 15 and 28, the second occurrence of "a first radius" has been changed to "the first radius" to conform to the established antecedent basis. In claim 25, line 16, the term "second set of magnetic flux" has been changed to "third set of magnetic flux" to correspond to the subject matter set forth in base claim 20. In claim 31, the phrase "of said first magnet" has been inserted after "third pole surface" and "forth pole surface" to distinguish from the third and

forth pole surfaces of the second magnet.

CONCLUSION

Attached hereto are eighteen (18) pages which present a marked up version of the changes made to this application by the current amendment. The first page of the eighteen (18) attached pages is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

In view of the foregoing amendments and remarks, it is respectfully submitted that the subject application is now in condition for allowance with pending claims 1-4, 6-9, 11-13 and 15-35. Reconsideration of the present application, as amended, is respectfully requested. Timely action towards a Notice of Allowability is hereby solicited. The Examiner is encouraged to contact the undersigned by telephone to resolve any outstanding matters concerning the present application.

Respectfully submitted,

Brad A. Schepers
Registration No.: 45,431
Woodard, Emhardt, Naughton, Moriarty & McNett
Bank One Center Tower
111 Monument Circle, Suite 3700
Indianapolis, Indiana 46204-5137
(317) 634-3456

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Pursuant to 37 CFR § 1.125(b)(2), a second substitute specification has been filed herewith pursuant to 37 CFR § 1.125(c). The second substitute specification includes no new matter in accordance with 37 CFR § 1.125(b)(1).

IN THE CLAIMS:

Claims 1, 6, 11, 15, 20, 25, 28, 31, 33 and 35 have been amended as follows:

1. (Twice Amended) A magnetic rotational position sensor for sensing each degree of rotation of a control shaft about a first rotational axis over a definable range of rotation, said magnetic rotational position sensor comprising:

a loop pole piece including a plurality of pole pieces serially adjoined in a closed configuration to define an air gap area, a first pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a first radius having its opposite end located on a second rotational axis [over the definable range of rotation], a second pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a second radius having its opposite end located on said second rotational axis;

a magnet having a first pole surface and a second pole surface to generate magnetic flux, said magnet disposed within said air gap area of said loop pole piece,

wherein said first pole surface of said magnet faces said inner surface of said first pole piece and said second pole surface of said magnet faces said inner surface of said

second pole piece to enclose said magnetic flux within said loop pole piece whereby a magnetic field is established throughout said air gap area,

wherein said first pole surface of said magnet spatially faces said inner surface of said first pole piece to define a working air gap area of said air gap area therebetween, and

wherein said loop pole piece and said magnet are adjoined to the control shaft to synchronously rotate about said second rotational axis for each degree of rotation of the control shaft about the first rotational axis over the definable range of rotation whereby each degree of rotation of the control shaft about the first rotational axis over the definable range of rotation exclusively corresponds to a distinct degree of synchronized rotation of said magnetic field about said second rotational axis over the definable range of rotation; and

a magnetic flux sensitive transducer disposed within said working air gap area, said magnetic flux sensitive transducer being operable to sense a magnetic flux density of any portion of said magnetic flux passing through said magnetic flux sensitive transducer, wherein said inner surface of said first pole piece and said first pole surface of said magnet are contoured to arcuately configure said working air gap area therebetween whereby said magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field over the definable range of rotation.

6. (Twice Amended) A magnetic rotational position sensor for sensing each degree of rotation of a control shaft about a first rotational axis over a definable range of rotation, said magnetic rotational position sensor comprising:

a loop pole piece including a plurality of pole pieces serially adjoined in a closed configuration to define an air gap area, a first pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a first radius having its opposite end located on a second rotational axis [over the definable range of rotation], a second pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a second radius having its opposite end located on said second rotational axis;

a magnet having a first pole surface and a second pole surface to generate magnetic flux, said magnet disposed within said air gap area of said loop pole piece,

wherein said first pole surface of said magnet faces said inner surface of said first pole piece and said second pole surface of said magnet faces said inner surface of said second pole piece to enclose said magnetic flux within said loop pole piece whereby a magnetic field is established throughout said air gap area,

wherein said first pole surface of said magnet spatially faces said inner surface of said first pole piece to define a first working air gap area of said air gap area therebetween and said second pole surface of said magnet spatially faces said inner surface of said second pole piece to define a second working air gap area of said air gap area therebetween, and

wherein said loop pole piece and said magnet are adjoined to the control shaft to synchronously rotate about said second rotational axis for each degree of rotation of the control shaft about the first rotational axis over the definable range of rotation whereby each degree of rotation of the control shaft about the first rotational axis over the definable range of

rotation exclusively corresponds to a distinct degree of synchronized rotation of said magnetic field about said second rotational axis over the definable range of rotation;

a first magnetic flux sensitive transducer disposed within said first working air gap area, said first magnetic flux sensitive transducer being operable to sense a magnetic flux density of any first portion of said magnetic flux passing through said first magnetic flux sensitive transducer,

wherein said inner surface of said first pole piece and said first pole surface of said magnet are contoured to arcuately configure said first working air gap area therebetween whereby said first magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field over the definable range of rotation; and

a second magnetic flux sensitive transducer disposed within said second working air gap area, said second magnetic flux sensitive transducer being operable to sense a magnetic flux density of any second portion of said magnetic flux passing through said second magnetic flux sensitive transducer,

wherein said inner surface of said second pole piece and said second pole surface of said magnet are contoured to arcuately configure said second working air gap area therebetween whereby said second magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field over the definable range of rotation.

11. (Twice Amended) A magnetic rotational position sensor for sensing each degree of rotation of a control shaft about a first rotational axis over a definable range of rotation, said magnetic rotational position sensor comprising:

a loop pole piece including a plurality of pole pieces serially adjoined in a closed configuration to define an air gap area, a first pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a first radius having its opposite end located on a second rotational axis [over the definable range of rotation], a second pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a second radius having its opposite end located on said second rotational axis;

a first magnet having a first pole surface and a second pole surface to generate a first set of magnetic flux, said first magnet disposed within said air gap area of said loop pole piece;

a second magnet having a first pole surface and a second pole surface to generate a second set of magnetic flux, said second magnet disposed within said air gap area of said loop pole piece,

wherein said first pole surface of said first magnet faces said inner surface of said first pole piece, said first pole surface of said second magnet faces said inner surface of said second pole piece, and said second pole surface of said first magnet faces said second pole surface of said second magnet to enclose said first set of magnetic flux and said second set of magnetic flux within said loop pole piece whereby a magnetic field is established throughout said air gap area,

wherein said second pole surface of said first magnet spatially faces said second pole surface of said second magnet to define a working air gap area of said air gap area therebetween, and

wherein said loop pole piece, said first magnet, and said second magnet are adjoined to the control shaft to synchronously rotate about said second rotational axis for each degree of rotation of the control shaft about the first rotational axis over the definable range of rotation whereby each degree of rotation of the control shaft about the first rotational axis over the definable range of rotation exclusively corresponds to a distinct degree of synchronized rotation of said magnetic field about said second rotational axis over the definable range of rotation; and

a magnetic flux sensitive transducer disposed within said working air gap area, said magnetic flux sensitive transducer being operable to sense a magnetic flux density of a portion of a compilation of said first set of magnetic flux and said second set of magnetic flux passing through said magnetic flux sensitive transducer,

wherein said second pole surface of said first magnet and said second pole surface of said second magnetic are contoured to arcuately configure said working air gap area therebetween whereby said magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said at least one magnetic field over the definable range of rotation.

15. (Twice Amended) A magnetic rotational position sensor for sensing each degree of rotation of a control shaft about a first rotational axis, said magnetic rotational position sensor comprising:

a loop pole piece including a plurality of pole pieces serially adjoined in a closed configuration to define an air gap area, a first pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a first radius having its opposite end located on a second rotational axis, a second pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of [a] <u>the</u> first radius having its opposite end located on said second rotational axis;

a first magnet having a first pole surface and a second pole surface to generate a first set of magnetic flux, said first magnet disposed within said air gap area of said loop pole piece;

a second magnet having a first pole surface and a second pole surface to generate a second set of magnetic flux, said second magnet disposed within said air gap area of said loop pole piece,

wherein said first pole surface of said first magnet faces said inner surface of said first pole piece, said first pole surface of said second magnet faces said inner surface of said second pole piece, and said second pole surface of said first magnet faces said second pole surface of said second magnet to enclose said first set of magnetic flux and said second set of magnetic flux within said loop pole piece whereby a magnetic field is established throughout said air gap area,

wherein said first pole surface of said first magnet spatially faces said inner surface of said first pole piece to define a first working air gap area of said air gap area therebetween and said first pole surface of said second magnet spatially faces said inner surface of said second pole piece to define a second working air gap area of said air gap area therebetween, said first working air gap area and said second working air gap area being contiguous,

wherein said loop pole piece, said first magnet, and said second magnet are adjoined to the control shaft to synchronously rotate about said second rotational axis for each degree of rotation of the control shaft about the first rotational axis whereby each degree of rotation of the control shaft about the first rotational axis exclusively corresponds to a distinct degree of synchronized rotation of said magnetic field about said second rotational axis; and

a first magnetic flux sensitive transducer disposed within said air gap area of said loop pole piece, said first magnetic flux sensitive transducer locatable within said first working air gap area and locatable within said second working air gap area as said magnetic field is synchronously rotated about said second rotational axis, said first magnetic flux sensitive transducer being operable to sense a magnetic flux density of any portion of said first set of magnetic flux passing through said first magnetic flux sensitive transducer when said first magnetic flux sensitive transducer is located within said first working air gap area and being operable to sense a magnetic flux density of any portion of said second set of magnetic flux passing through said first magnetic flux sensitive transducer when said first magnetic flux sensitive transducer is located within said second working air gap area,

wherein said first pole surface of said first magnet and said inner surface of said first pole piece are contoured to arcuately configure said first working air gap area therebetween whereby said first magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said magnetic flux sensitive transducer is located within said first working air gap area, and

wherein said first pole surface of said second magnet and said inner surface of said second pole piece are contoured to arcuately configure said second working air gap area therebetween whereby said magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density passing through said magnetic flux sensitive transducer for each degree of said synchronized rotation of the control shaft and said magnetic field when said magnetic flux sensitive transducer is located within said second working air gap area.

20. (Twice Amended) A magnetic rotational position sensor for sensing each degree of rotation of a control shaft about a first rotational axis, said magnetic rotational position sensor comprising:

a loop pole piece including a plurality of pole pieces serially adjoined in a closed configuration to define an air gap area, a first pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a first radius having its opposite end located on a second rotational axis, a second pole piece of said

plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a first radius having its opposite end located on said second rotational axis;

a first magnet having a first pole surface and a second pole surface to generate a first set of magnetic flux, said first magnet disposed within said air gap area of said loop pole piece;

a second magnet having a first pole surface and a second pole surface to generate a second set of magnetic flux, said second magnet disposed within said air gap area of said loop pole piece;

a third magnet having a first pole surface and a second pole surface to generate a third set of magnetic flux, said third magnet disposed within said air gap area of said loop pole piece;

a fourth magnet having a first pole surface and a second pole surface to generate a fourth set of magnetic flux, said fourth magnet disposed within said air gap area of said loop pole piece,

wherein said first pole surface of said first magnet faces said first pole surface of said third magnet, said second pole surface of said third magnet faces said inner surface of said first pole piece, said first pole surface of said second magnet faces said first pole surface of said fourth magnet, said second pole surface of said fourth magnet faces said inner surface of said second pole piece, and said second pole surface of said first magnet faces said second pole surface of said second magnet to enclose said first set of magnetic flux, said second set of magnetic flux, said third set of magnetic flux and said fourth set of magnetic flux within said loop pole piece whereby a magnetic field is established throughout said air gap area,

wherein said first pole surface of said first magnet spatially faces said first pole surface of said third magnet to define a first working air gap area of said air gap area therebetween and said [second] <u>first</u> pole surface of said second magnet spatially faces said first pole surface of said fourth magnet to define a second working air gap area of said air gap area therebetween, said first working air gap area and said second working air gap area being contiguous,

wherein said loop pole piece, said first magnet, said second magnet, said third magnet and said fourth magnet are adjoined to the control shaft to synchronously rotate about said second rotational axis for each degree of rotation of the control shaft about the first rotational axis whereby each degree of rotation of the control shaft about the first rotational axis exclusively corresponds to a distinct degree of synchronized rotation of magnetic field about said second rotational axis; and

a first magnetic flux sensitive transducer disposed within said air gap area of said loop pole piece, said first magnetic flux sensitive transducer locatable within said first working air gap area and locatable within said second working air gap area as said loop pole piece, said first magnet, said second magnet, said third magnet and said fourth magnet are synchronously rotated about said second rotational axis, said first magnetic flux sensitive transducer operable to sense a magnetic flux density of any compilation of said first set of magnetic flux and said third set of magnetic flux when located within said first working air gap area and being operable to <u>sense</u> a magnetic flux density of any compilation of said second set of magnetic flux and said fourth set of magnetic flux when located within said second working air gap area,

wherein said first pole surface of said first magnet and said first pole surface of said third magnet are contoured to arcuately configure said first working air gap area therebetween whereby said first magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said first magnetic flux sensitive transducer is located within said first working air gap area, and

wherein said first pole surface of said second magnet and said first pole surface of said fourth magnet are contoured to arcuately configure said second working air gap area therebetween whereby said first magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said first magnetic flux sensitive transducer is located within said second working air gap area.

25. (Twice Amended) The magnetic rotational position sensor of claim 20 further comprising a second magnetic flux sensitive transducer, said second magnetic flux sensitive transducer operable to sense a magnetic flux density passing through said second magnetic flux sensitive transducer,

wherein said second pole surface of said third magnet spatially faces said inner surface of said first pole piece to define a third working air gap area of said air gap area therebetween and said second pole surface of said fourth magnet spatially faces said inner surface of said second pole piece to define a fourth working air gap area of said air gap area therebetween, <u>said third working air gap and said fourth working air gap area being contiguous.</u>

wherein said second magnetic flux sensitive transducer is disposed within said air gap area of said loop pole piece, said second magnetic flux sensitive transducer locatable within said third working air gap area and locatable within said fourth working air gap area as said loop pole piece, said first magnet, said second magnet, said third magnet and said fourth magnet are synchronously rotated about said second rotational axis,

wherein said second magnetic flux sensitive transducer is operable to sense a magnetic flux density of any portion of said [second] third set of magnetic flux when located within said third working air gap area and is operable to sense a magnetic flux density of any portion of said fourth set of magnetic flux when located within said fourth working air gap area,

wherein said second pole surface of said third magnet and said inner surface of said first pole piece are contoured to arcuately configure said third working air gap area therebetween whereby said second magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said second magnetic flux sensitive transducer is located within said third working air gap area, and

wherein said second pole surface of said fourth magnet and said inner surface of said second pole piece are contoured to arcuately configure said fourth working air gap area therebetween whereby said second magnetic flux sensitive transducer is operable to sense a different magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said second magnetic flux sensitive transducer is located within said fourth working air gap area.

28. (Twice Amended) A magnetic rotational position sensor for sensing each degree of rotation of a control shaft about a first rotational axis, said magnetic rotational position sensor comprising:

a loop pole piece including a plurality of pole pieces serially adjoined in a closed configuration to define an air gap area, a first pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of a first radius having its opposite end located on a second rotational axis, a second pole piece of said plurality of pole pieces having an inner surface swept out over the definable range of rotation by an outer end of [a] <u>the</u> first radius having its opposite end located on said second rotational axis;

a first magnet having a first pole surface, and a second pole surface to generate a first set of magnetic flux, said first magnet disposed within said air gap area of said loop pole piece;

a second magnet having a first pole surface, a second pole surface, a third pole surface, and a fourth pole surface to generate a second set of magnetic flux, said second magnet disposed within said air gap area of said loop pole piece,

wherein said first pole surface of said first magnet faces said first pole surface of said second magnet, said second pole surface of said second magnet faces said inner surface of said first pole piece, said second pole surface of said first magnet faces said third pole surface of said second magnet, and said fourth pole surface of said second magnet faces said inner surface of said second pole piece to enclose said first set of magnetic flux, and said

second set of magnetic flux within said loop pole piece whereby a magnetic field is established throughout said air gap area,

wherein said first pole surface of said first magnet spatially faces said first pole surface of said second magnet to define a first working air gap area of said air gap area therebetween and said second pole surface of said first magnet spatially faces said third pole surface of said second magnet to define a second working air gap area of said air gap area therebetween, said first working air gap area and said second working air gap area being contiguous,

wherein said loop pole piece, said first magnet, and said second magnet are adjoined to the control shaft to synchronously rotate about said second rotational axis for each degree of rotation of the control shaft about the first rotational axis whereby each degree of rotation of the control shaft about the first rotational axis exclusively corresponds to a distinct degree of synchronized rotation of said magnetic field about said second rotational axis; and

a first magnetic flux sensitive transducer disposed within said air gap area of said loop pole piece, said first magnetic flux sensitive transducer locatable within said first working air gap area of said loop pole piece and locatable within said second working air gap area of said loop pole piece as said loop pole piece, said first magnet, and said second magnet are synchronously rotated about said second rotational axis, said first magnetic flux sensitive transducer operable to sense a magnetic flux density of any compilation of said first set of magnetic flux and said second set of magnetic flux passing through said first magnetic flux sensitive transducer,

wherein said first pole surface of said first magnet and said first pole surface of said second magnet are contoured to arcuately configure said first working air gap area therebetween whereby said first magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said first magnetic flux sensitive transducer is located within said first working air gap area, and

wherein said second pole surface of said first magnet and said third pole surface of said second magnet are contoured to arcuately configure said second working air gap area therebetween whereby said first magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said first magnetic flux sensitive transducer is located within said second working air gap area.

31. (Twice Amended) The magnetic rotational position sensor of claim 28 further comprising an auxiliary pole piece, wherein said first magnet further has a third pole surface and a fourth pole surface spatially facing said third pole surface, said auxiliary pole piece being disposed between said third pole surface <u>of said first magnet</u> and said fourth pole surface <u>of said first magnet</u>.

33. (Twice Amended) The magnetic rotational position sensor of claim 28 further comprising a second magnetic flux sensitive transducer, said second magnetic flux sensitive transducer operable to sense a magnetic flux density of any second compilation of said first

set of magnetic flux and said second set of magnetic flux passing through said second magnetic flux sensitive transducer,

wherein said second pole surface of said second magnet spatially faces said inner surface of said first pole piece to define a third working air gap area of said air gap area therebetween, and said fourth pole surface of said second magnet spatially faces said inner surface of said second pole piece to define a fourth working air gap area of said air gap area therebetween, said third working air gap area and said fourth working air gap area being contiguous,

wherein said second magnetic flux sensitive transducer is disposed within said air gap area of said loop pole piece, said second magnetic flux sensitive transducer locatable within said third working air gap area and locatable within said fourth working air gap area as said loop pole piece, said first magnet, and said second magnet are synchronously rotated about said second rotational axis,

wherein said [first] <u>second</u> pole surface of said second magnet and said inner surface of said first pole piece are contoured to arcuately configure said third working air gap area therebetween whereby said second magnetic flux sensitive transducer is operable to sense a different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said second magnetic flux sensitive transducer is located within said third working air gap area, and

wherein said fourth pole surface of said second magnet and said inner surface of said second pole piece are contoured to arcuately configure said fourth working air gap area therebetween whereby said second magnetic flux sensitive transducer is operable to sense a

different magnitude of magnetic flux density for each degree of said synchronized rotation of the control shaft and said magnetic field when said second magnetic flux sensitive transducer is located within said fourth working air gap area.

35. (Twice Amended) The magnetic rotational position sensor of claim 33 wherein said fourth pole surface of said second <u>magnet</u> has a convex contour and said inner surface of said second pole piece has a concave contour.